



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/926,173	09/18/2001	Hideki Munakata	P107242-00021	9025

4372 7590 07/20/2004

ARENT FOX KINTNER PLOTKIN & KAHN  
1050 CONNECTICUT AVENUE, N.W.  
SUITE 400  
WASHINGTON, DC 20036

EXAMINER

MARKHAM, WESLEY D

ART UNIT	PAPER NUMBER
----------	--------------

1762

DATE MAILED: 07/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/926,173

Applicant(s)

MUNAKATA, HIDEKI

Examiner

Wesley D Markham

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2004 and 10 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 3-10 and 12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-10 and 12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/18/01 and 4/27/04 (5 replace. sheets) is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. Acknowledgement is made of the amendments filed by the applicant on 4/27/2004 and 5/10/2004 in which five (5) sheets of replacement drawings depicting Figures 9 – 12 and 14 were submitted, the specification of the instant application was amended, a substitute abstract of the disclosure was submitted, Claims 1, 2, and 11 were canceled, and Claims 3 and 4 were amended. **Claims 3 – 10 and 12** are currently pending in U.S. Application Serial No. 09/926,173, and an Office Action on the merits follows.

### ***Priority***

2. Receipt is acknowledged of the papers submitted by the International Bureau under 35 U.S.C. 119(a)-(d) and pursuant to PCT Rule 17.2(a) (i.e., a copy of the certified copy of Japanese priority document JP 2000-16119, filed on 1/25/2000), which papers have been placed of record in the file.

### ***Drawings***

3. The five (5) sheets of replacement drawings labeling Figures 9 – 12 and 14 as "Prior Art" filed by the applicant on 4/27/2004 have been received and are approved. In light of these replacement drawings and the amendment to the specification to insert the reference character "W", the objections to the drawings set forth in paragraphs 5

Art Unit: 1762

– 6 of the previous Office Action (i.e., the non-final Office Action mailed on 1/7/2004) are withdrawn.

***Specification***

4. The objections to the specification, including the abstract of the disclosure, set forth in paragraphs 8 – 9 of the previous Office Action, are withdrawn in light of the applicant's amendment filed on 4/27/2004 and substitute abstract filed on 5/10/2004.

***Claim Rejections - 35 USC § 102***

5. Please note that the 35 U.S.C. 102(a) and (b) rejections of Claims 1, 2, and 11, set forth in paragraphs 14 – 17 of the previous Office Action, are withdrawn in light of the applicant's amendment in which Claims 1, 2, and 11 were canceled.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3 – 6, 7 (as it depends from all of Claims 3 – 6), 8 (as it depends from all of Claims 3 – 6), 9 (as it depends from Claim 8, as Claim 8 depends from all of Claims 3 – 6), 10 (as it depends from all of Claims 3 – 6), and 12 (as it depends from all of

Claims 3 – 6) are rejected under 35 U.S.C. 103(a) as being unpatentable over the AAPA in view of Fujitsu Ltd (JP 09-122610 A).

8. Regarding independent **Claims 3 and 4**, the AAPA teaches a process for cleaning a wafer storage case, the process comprising the steps of cleaning the surface of a synthetic resin wafer storage case for housing wafers with a surfactant, cleaning the wafer storage case with pure water, and drying the cleaned wafer storage case (Figure 12; page 2, lines 3 – 18; page 3, lines 11 – 20; page 4, lines 4 – 6; page 5, lines 3 – 6; and page 14, lines 18 – 19 of the applicant's specification). Additionally, the AAPA cleaning method for a synthetic resin wafer storage case shown in Figure 12 (i.e., surfactant cleaning, two steps of pure water cleaning, and clean oven drying) leaves a dust generation-preventing coating layer of the surfactant (i.e., a "coating agent") on the surface of the wafer storage case prior to the pure water cleaning and drying steps (see, for example, page 5, lines 8 – 13 of the applicant's specification). In other words, the surfactant cleaning step taught by the AAPA is equivalent to the step of coating a surface of the synthetic resin wafer storage case for housing wafers with a coating agent, as required by Claims 3 and 4. Further, the AAPA teaches that particles exist on the synthetic resin surface of the storage case, are moved onto the surface of the surfactant layer "L" during the surfactant cleaning step, and are washed away during the pure water cleaning step ("Prior Art" Figure 14, steps (a) and (b); page 5, lines 14 – 17, and page 6, lines 1 – 3 of the applicant's specification). The AAPA does not explicitly teach (1) drying the wafer storage case coated with the coating agent (Claim 3 only), (2) that a coating layer of the coating

agent (i.e., the surfactant) remains across the surface of the wafer storage case after the pure water cleaning step(s), and (3) that dust generation from the surface of the wafer storage case is prevented by the aforementioned coating layer of the coating agent. Specifically, the AAPA teaches that the surfactant coating layer formed on the surface of the storage case is removed along with the contaminant particles to expose the surface during the subsequent pure water cleaning steps. Fujitsu Ltd teaches an analogous process for cleaning and drying various articles (Abstract). The process of Fujitsu Ltd comprises the steps of (1) immersing the article to be cleaned in an aqueous, water-repellent surfactant solution to replace dust on the surface of the article with the surfactant, (2) hanging the article and carrying it to one or two pure water washing / cleaning stations, (3) using the pure water washing to remove excess surfactant from the surface of the article, and then (4) drying the article (Abstract, Figures 1, 2, and 22, and paragraphs [0054] – [0060], [0107], and [0108]). Importantly, the process of Fujitsu Ltd, including the pure water washing / cleaning step(s), is carried out to insure that at least one molecular layer of the water-repellent surfactant sticks to and remains on the surface of the article (Abstract, paragraphs [0007], [0008], [0012], [0013], [0028], [0030], [0037], [0044], and [0060]). By insuring that at least one molecular layer of the water-repellent surfactant remains on the surface of the article after the pure water washing steps, the subsequent drying step can be more easily and efficiently carried out (e.g., at lower temperatures and for a shorter time) (paragraphs [0033], [0048], [0060] – [0063], and [0109]). This is advantageous in the art of cleaning resin products

because, by minimizing the overall drying process, the resin product will not be adversely affected (e.g., due to heat deformation) (paragraphs [0047], [0048], and [0109] – [0111]). The process of Fujitsu Ltd is applicable to hollow articles (paragraphs [0039] and [0092]) and is used to effectively clean and remove dust from the surface of the article (Abstract, paragraphs [0007], [0008], [0095], and [0109]). Therefore, it would have been obvious to one of ordinary skill in the art to utilize the cleaning / drying process of Fujitsu Ltd (i.e., a process in which a molecular coating layer of the surfactant remains across the surface of the wafer storage case after the pure water cleaning step(s)) as the wafer storage case cleaning process of the AAPA with the reasonable expectation of (1) success, as Fujitsu Ltd teaches that their process of cleaning and removing dust is applicable to hollow articles and resin articles (i.e., categories in which a synthetic resin wafer storage case would fall), and (2) obtaining the benefits of using the cleaning process of Fujitsu Ltd, such as efficiently and precisely performing the drying process (i.e., due to the presence of the surfactant layer on the surface of the article), thereby reducing processing time, and preventing heat-induced damage or deformation of the synthetic resin wafer storage case. The combination of the AAPA and Fujitsu Ltd does not explicitly teach that dust generation from the surface of the wafer storage case is prevented by the aforementioned surfactant coating layer. However, the surfactant coating layer of Fujitsu Ltd (or any coating layer, for that matter) would inherently prevent dust generation from the surface of the wafer storage case because such a layer would prevent the surface of the wafer storage case, as well

as the dust particles generated thereon / therefrom, from being exposed and, in effect, “trap” the dust particles on the surface. Additionally and regarding Claim 3, the combination of the AAPA and Fujitsu Ltd does not explicitly teach drying the wafer storage case coated with the coating agent (i.e., before the pure water cleaning step). However, Fujitsu Ltd does teach that, after the surfactant molecular layer forming step, the article is hung up on a carrying machine “13” and transferred to the first shower cleaning device (i.e., for pure water cleaning and removal of excess surfactant) (Abstract, Figure 2, and paragraphs [0057] – [0058]). This step of hanging and transporting taught by Fujitsu Ltd would have inherently at least partially dried the article (i.e., the wafer storage case) coated with the surfactant due to the air-drying that would necessarily occur during the hanging and transporting steps. Further, Fujitsu Ltd does not explicitly teach that the pure water washing step removes particles on the surface of the coating (i.e., surfactant) layer. However, Fujitsu Ltd does teach that the dust on the surface of the article is transposed with the surfactant (paragraph [0008]) and that the overall process effectively cleans and removes dust from the surface of the article (Abstract, paragraphs [0007], [0008], [0095], and [0109]). As such, the water washing step of Fujitsu Ltd would have inherently removed particles that remain on the surface of the surfactant layer, specifically the dust particles that were transposed with the surfactant layer during the surfactant cleaning step. Regarding **Claims 5 and 6**, the combination of the AAPA and Fujitsu Ltd does not explicitly teach that the pure water used in the step of cleaning has a low specific resistance (Claim 5), particularly 10 MΩ·cm or less



(Claim 6). Specifically, Fujitsu Ltd is silent as to the specific resistance of the pure water utilized in the cleaning process. However, the AAPA teaches that, in the art of cleaning a wafer storage case, it was known to clean the case with pure water having a specific resistance of 10 MΩ·cm or higher (page 2, lines 15 – 25 of the applicant's specification). Therefore, it would have been obvious to one of ordinary skill in the art to utilize pure water having a specific resistance in the range of 10 MΩ·cm or higher, for example 10 MΩ·cm, in the cleaning process of the combination of the AAPA and Fujitsu Ltd because the AAPA teaches that pure water having such a specific resistance can be and is known to be used to clean wafer storage cases (i.e., water having such a specific resistance is operable to clean wafer storage cases). Please note that the selection of a known material (in this case, pure water having a specific resistance of 10 MΩ·cm) based on its suitability for its intended use (in this case, cleaning a wafer storage case) is *prima facie* obvious (MPEP 2144.07). Regarding **Claim 7** (as it depends from Claims 3 – 6), the combination of the AAPA and Fujitsu Ltd also teaches that the surface of the wafer storage case is coated with the coating agent by immersing the case in an aqueous solution of the coating agent (Abstract, Figure 2, and paragraph [0057]). Regarding **Claims 8 and 9** (as they depend from Claims 3 – 6), the combination of the AAPA and Fujitsu Ltd does not explicitly teach that the wafer storage case to be coated is a cleaned wafer storage case (Claim 8), specifically a wafer storage case cleaned with surfactant cleaning and pure water washing (Claim 9). However, Fujitsu Ltd does teach that, in certain cases, it is desirable to pre-clean the article prior to the surfactant cleaning / coating

step (Figure 4, and paragraphs [0066] – [0067]). Additionally, please note that applicant's Claims 8 and 9 encompass a situation in which the surfactant cleaning and pure water washing processes are simply repeated. It would have been obvious to one of ordinary skill in the art to pre-clean the wafer storage case by surfactant cleaning and pure water cleaning (i.e., to simply repeat the cleaning process of the combination of the AAPA and Fujitsu Ltd) with the reasonable expectation of successfully and advantageously insuring that the wafer storage case is as clean as possible (i.e., improving the cleanliness of the storage case due to repeating the cleaning steps). Regarding **Claim 10** (as it depends from Claims 3 – 6), the combination of the AAPA and Fujitsu Ltd also teaches that the coating agent is a surfactant (see the discussion of Claims 3 and 4 above). Regarding **Claim 12** (as it depends from Claims 3 – 6), the combination of the AAPA and Fujitsu Ltd does not explicitly teach preparing wafers and housing the wafers in the wafer storage case treated by the process according to any one of Claims 3 – 6. However, the wafer storage case of the AAPA is clearly designed and intended to be used to house wafers (page 2, lines 3 – 18 of the applicant's specification). Therefore, it would have been obvious to one of ordinary skill in the art to house wafers in the wafer storage case of / produced by the combination of the AAPA and Fujitsu Ltd (i.e., after "preparing" the wafers by, for example, fabricating the wafers and transporting the wafers to and into the storage case) because the wafer storage case of the AAPA is designed and intended to be used in that manner (i.e., to house wafers). In other words, one of ordinary skill in the art would not have been expected to go through

Art Unit: 1762

the trouble of performing the extensive cleaning process taught by either the AAPA or Fujitsu Ltd unless wafers were to be housed in the aforementioned storage case.

9. In an alternative to the reasoning presented above, Claims 5, 6, 7 (as it depends from Claims 5 and 6), 8 (as it depends from Claims 5 and 6), 9 (as it depends from Claim 8, as Claim 8 depends from Claims 5 and 6), 10 (as it depends from Claims 5 and 6), and 12 (as it depends from Claims 5 and 6) are rejected under 35 U.S.C. 103(a) as being unpatentable over the AAPA in view of Fujitsu Ltd (JP 09-122610 A), and in further view of Katou et al. (USPN 6,158,721).
10. The combination of the AAPA and Fujitsu Ltd teaches all the limitations of **Claims 5, 6, 7** (as it depends from Claims 5 and 6), **8** (as it depends from Claims 5 and 6), **9** (as it depends from Claim 8, as Claim 8 depends from Claims 5 and 6), **10** (as it depends from Claims 5 and 6), and **12** (as it depends from Claims 5 and 6) as set forth above in paragraph 8, except for a process wherein the pure water used in the step of cleaning has a low specific resistance (Claim 5), particularly 10 MΩ·cm or less (Claim 6). Specifically, Fujitsu Ltd is silent as to the specific resistance of the pure water utilized in the cleaning process. However, Katou et al. teaches that when semiconductor devices are cleaned with pure water having a high resistivity, static electricity is generated, which causes the adsorption of particulates (Col.1, lines 7 – 24). To solve this problem, Katou et al. teaches controlling the resistivity of pure water used in a cleaning process to be, for example, 0.05 MΩ·cm (i.e., a value within the applicant's claimed range) (Col.5, lines 32 – 46, and Col.10, lines 3 – 21).

Therefore, it would have been obvious to one of ordinary skill in the art to utilize pure water having a low resistivity of, for example,  $0.05 \text{ M}\Omega\cdot\text{cm}$  (as taught by Katou et al.) in the cleaning process of the combination of the AAPA and Fujitsu Ltd with the reasonable expectation of successfully and advantageously preventing the build-up of static electricity on the surface of the wafer storage case, thereby preventing the detrimental adsorption of particulates to the case.

### ***Response to Arguments***

11. Applicant's arguments filed on 4/27/2004 have been fully considered but they are not persuasive.
12. Regarding independent Claims 3 and 4, the applicant argues that the claims require cleaning the dried wafer storage case and removing particles on a surface of the coating layer using pure water such that the coating layer of the coating agent remains across the surface of the wafer storage case. As a result, dust generation is prevented by blocking the particles constantly generated from the wafer storage case surface with a layer of surfactant. The applicant then states that both Fujitsu and AAPA only disclose the conventional cleaning step, shown in Figure 14, and as a result, dust generation cannot be prevented.
13. In response, this argument is not convincing. The applicant's argument appears to be based on the assertion that neither the AAPA nor Fujitsu teaches that a coating layer of the coating agent (i.e., the surfactant) remains across the surface of the wafer storage case, thereby blocking the particles generated by the wafer storage

case surface. However, as clearly set forth above (see paragraph 8), the process of Fujitsu Ltd comprises the steps of (1) immersing the article to be cleaned in an aqueous, water-repellent surfactant solution to replace dust on the surface of the article with the surfactant, (2) hanging the article and carrying it to one or two pure water washing / cleaning stations, (3) using the pure water washing to remove excess surfactant from the surface of the article, and then (4) drying the article (Abstract, Figures 1, 2, and 22, and paragraphs [0054] – [0060], [0107], and [0108]). Importantly, the process of Fujitsu Ltd, including the pure water washing / cleaning step(s), is carried out to insure that at least one molecular layer of the water-repellent surfactant sticks to and remains on the surface of the article (Abstract, paragraphs [0007], [0008], [0012], [0013], [0028], [0030], [0037], [0044], and [0060]). Contrary to the applicant's position, this teaching of Fujitsu Ltd shows that a coating layer of the coating agent remains across the surface of the wafer storage case after the pure water washing step(s). By insuring that at least one molecular layer of the water-repellent surfactant remains on the surface of the article after the pure water washing steps, the subsequent drying step can be more easily and efficiently carried out (e.g., at lower temperatures and for a shorter time) (paragraphs [0033], [0048], [0060] – [0063], and [0109]). This is advantageous in the art of cleaning resin products because, by minimizing the overall drying process, the resin product will not be adversely affected (e.g., due to heat deformation) (paragraphs [0047], [0048], and [0109] – [0111]). The process of Fujitsu Ltd is applicable to hollow articles (paragraphs [0039] and [0092]) and is used to effectively clean and remove dust

from the surface of the article, a goal analogous to that of the applicant's (Abstract, paragraphs [0007], [0008], [0095], and [0109]). The examiner stresses that the fact that the applicant has recognized another advantage (i.e., that a layer of surfactant which remains across the surface of a wafer storage case prevents dust generation) which would flow naturally from following the suggestion of the prior art (i.e., insuring that a layer of surfactant remains on the surface of the article so that the subsequent drying step can be more easily and efficiently carried out) cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D Markham whose telephone number is (571) 272-1422. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.

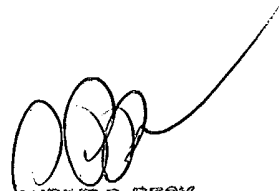
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



WDM

Wesley D Markham  
Examiner  
Art Unit 1762



SHRIVE P. BECK  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700